

In the Claims:

Claims 1 to 15 (Canceled).

1 16. (Currently amended) Method for milling a freeform surface
2 on a workpiece using a milling machine, whereby the
3 workpiece is milled by a tool of the milling machine such
4 that a desired freeform surface is formed, and to carry out
5 the milling the tool is moved relative to the workpiece
6 along a tool path defined by splines whereby the motion of
7 the tool is controlled based on the splines, characterized
8 in that the splines are calculated as polynomials directly
9 from support control points stored in workpiece coordinates
10 or in machine coordinates in a CAD/CAM system, and the tool
11 path is generated from six splines if the support control
12 points are defined in workpiece coordinates, and is
13 generated from five splines if the support control points
14 are defined in machine coordinates, whereby one independent
15 spline is produced for each coordinate.

1 17. (Previously presented) Method according to claim 16,
2 characterized in that, for each tool path, the splines are
3 calculated through the use of one or more interpolation
4 parameters which are equal for all of the splines of the
5 respective tool path, so that all of the splines of the
6 respective tool path are synchronized with one another.

1 18. (Currently amended) Apparatus for milling a freeform
2 surface on a workpiece, whereby a tool is adapted to mill
3 the workpiece in such a manner so that a desired freeform
4 surface is formed, comprising a programming arrangement
5 (21) for programming a tool path, and comprising at least
6 one control arrangement (28) for controlling a motion of
7 the tool relative to the workpiece along the tool path
8 defined by splines, characterized in that the programming
9 arrangement (21) is embodied as a CAD/CAM system, and
10 further comprising means (25) allocated to the programming
11 arrangement (21) and adapted to calculate the splines
12 as polynomials directly from support control points stored
13 in workpiece coordinates or machine coordinates in the
14 CAD/CAM system in such a manner so that the means (25) are
15 adapted to generate the tool path from six splines if the
16 support control points are defined in workpiece
17 coordinates, and from five splines if the support control
18 points are defined in machine coordinates, whereby an
19 independent spline is produced for each coordinate, and
20 wherein the CAD/CAM system is adapted to produce at least
21 one APT file (22), and further comprising at least one
22 downstream-connected post-processor (26) adapted to convert
23 the at least one APT file into at least one control file
24 (27) that is executable by the or each control arrangement
25 (28), and whereby the or each control arrangement (28) is
26 adapted to control the motion of the tool along the tool
27 path based on and in accordance with the splines.

1 19. (Previously presented) Apparatus according to claim 18,
2 further comprising an APT processor (23), characterized in
3 that the means (25) allocated to the programming
4 arrangement (21) are arranged and adapted to transfer the
5 splines to the APT processor (23) which is arranged and
6 adapted to transfer the splines to the or each
7 post-processor (26), whereby the or each post-processor
8 (26) is arranged and adapted to provide the splines to the
9 or each control arrangement (28) in a polynomial format.

1 20. (Currently amended) A method of milling a freeform surface
2 on a workpiece using a miller tool, comprising the steps:
3 a) defining tool path [[way]] control points, each
4 respectively in six workpiece coordinates or five
5 machine coordinates, wherein said [[way]] control
6 points define points within tolerance limits along a
7 contour of a nominal freeform surface that is to be
8 milled;
9 b) generating a plurality of splines as polynomials
10 directly dependent on and fitting said [[way]] control
11 points sufficiently closely to remain within said
12 tolerance limits of said contour, wherein a respective
13 independent one of said splines is respectively
14 generated for each one of said workpiece coordinates
15 or said machine coordinates of all of said [[way]]
16 control points, so that said plurality of splines
17 includes a total of six splines respectively allocated
18 to said six workpiece coordinates if said [[way]]

19 control points are defined in said six workpiece
20 coordinates, and said plurality of splines includes a
21 total of five splines respectively allocated to said
22 five machine coordinates if said [[way]] control
23 points are defined in said five machine coordinates;
24 and

25 c) moving said miller tool in contact with and relative
26 to said workpiece so that said miller tool mills said
27 workpiece, and controlling said moving of said miller
28 tool directly based on and in accordance with said
29 plurality of splines as polynomials respectively
30 allocated to said workpiece coordinates or said
31 machine coordinates so that said miller tool moves
32 along a tool path defined by said splines
33 as polynomials in said workpiece coordinates or said
34 machine coordinates and thereby mills an actual
35 freeform surface on said workpiece within said
36 tolerance limits of said contour of said nominal
37 freeform surface.

1 **21.** (Currently amended) An apparatus for milling a freeform
2 surface on a workpiece, comprising:

3 a movable miller tool that is movable relative to the
4 workpiece;

5 plural control arrangements respectively adapted to
6 control a motion of said miller tool respectively in six
7 workpiece coordinates or in five machine coordinates;

8 a programming arrangement programmed to define tool
9 path [[way]] control points in said six workpiece
10 coordinates or in said five machine coordinates, wherein
11 said [[way]] control points define points within tolerance
12 limits along a contour of a nominal freeform surface that
13 is to be milled;

14 a processing arrangement that is interposed between
15 said programming arrangement and said control arrangements,
16 and that is adapted and programmed to generate a plurality
17 of splines as polynomials directly dependent on and fitting
18 said [[way]] control points sufficiently closely to remain
19 within said tolerance limits of said contour, wherein a
20 respective independent one of said splines is respectively
21 to be generated for each one of said workpiece coordinates
22 or said machine coordinates of all of said [[way]] control
23 points, so that said plurality of splines includes a total
24 of six splines respectively allocated to said six workpiece
25 coordinates if said [[way]] control points are defined in
26 said six workpiece coordinates, and said plurality of
27 splines includes a total of five splines respectively
28 allocated to said five machine coordinates if said [[way]]
29 control points are defined in said five machine
30 coordinates; and

31 wherein said control arrangements are adapted to
32 control the motion of said miller tool directly based on
33 and in accordance with said plurality of splines
34 as polynomials respectively allocated to said workpiece
35 coordinates or said machine coordinates so that said miller

36 tool is adapted to move along a tool path defined by said
37 splines as polynomials in said workpiece coordinates or
38 said machine coordinates and thereby to mill an actual
39 freeform surface on said workpiece within said tolerance
40 limits of said contour of said nominal freeform surface.

[RESPONSE CONTINUES ON NEXT PAGE]